

j7 End Devonian marine extinctions < decline >

If I'd known I was going to live this long, I'd have taken better care of myself. —centenarian Eubie Blake.¹

Mass extinctions occurred in the marine realm when, just before the end of the Devonian, acritarchs (the only phytoplankton with an extensive Devonian fossil record) became rare. The reef community became forever changed. On the land, life appears to have been little affected, although the marine record is that world climate may have cooled significantly at this time. The evidence for that (in New York State) is that glass sponges, which today are restricted to cool waters, began to thrive where formerly successful tropical marine fauna had gone extinct. In Famennian (**Figure j7.1**), strata only ~15% of Frasnian brachiopod genera are found and goniatite ammonoids are greatly declined from their Givetian heyday. Marine extinctions over early in Famennian, and commenced late in Frasnian, span across a “charcoal gap” on land and widespread evidence of marine anoxia ~380 Ma.² After the Frasnian, stromatoporoids and rugose corals are rare. Placoderms almost disappear. Until then, during the Devonian, they had been the dominant pelagic carnivores. Trilobites disappeared. Tabulate corals are no more (these had achieved their greatest faunal diversity during Middle Devonian and had been important reef contributors for 120 million years). Bryozoans declined after the Givetian when clastic limestones are mostly of their remains! □

Figure j7.1 Stratigraphic stages of the Devonian system

| SYSTEM | SERIES | STAGE | | |
|----------|--------|------------|----------------|--|
| | | European | North American | |
| DEVONIAN | UPPER | Framennian | Chautauquan | |
| | | Frasnian | Senecan | |
| | MIDDLE | Givetian | Erian | |
| | | Eifelian | | |
| | | Emsian | | |
| | LOWER | Siegenian | Ulsterian | |
| | | Gedinnian | | |
| | 363 Ma | | | |
| | 409 Ma | | | |

Piankasha offlap
← time of extinctions
Extensive reef building



Footnote j6.1 In Wales, the ORS is locally conformable on, and elsewhere buries an angular unconformity cut across folded graywackes, which Roderick Murchison and Adam Sedgwick originally agreed, correlate with like-in-appearance folded graywackes in Devon. However, in 1834, **Henry Thomas de la Beche** (1796-1855) found the coal measures of Devonshire collieries to be conformable within the graywackes, and that the coal plants in them are all but identical to Carboniferous plants. Murchison had earlier decided that, in contrast to the defining coals of Carboniferous strata, which overlie the ORS, a defining feature of the graywackes, which he believed everywhere underlie the ORS, was the absence of coals. So without examining the field evidence, he published his opinion in 1935 that the Devon coal measures were separated from the graywackes by an angular unconformity. Nevertheless, like the nose in Beche’s physiognomy, an ugly fact which that skilled draftsman and cartoonist could not wish away (his wife had divorced him for a comelier man), is that no such unconformity exists. Members of the British “Geological Society” and amateur geologist were galvanized by Beche’s cry: “Let us hope that the day is past when preconceived opinions are to be set up, as good as arguments, against facts; because if they are, let that fact at least be clearly understood, and let us be consistent, and no longer boast of our adherence to the Baconian philosophy.” In 1839, Murchison published his resolution: The conformable sequence of strata in Devonshire is contemporaneous, at its top, with the Carboniferous but, lower down, on the basis of fossils (in particular spiriferid brachiopods, and tabulate & rugose corals collected and described by William Lonsdale), “the South Devon rocks would be found to occupy an intermediate place between Carboniferous and Silurian systems.”³